



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,779	01/21/2005	Yasuhiro Komiya	05046/LH	2530
1933	7590	03/17/2009	EXAMINER	
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC			THOMAS, MIA M	
220 Fifth Avenue			ART UNIT	PAPER NUMBER
16TH Floor				2624
NEW YORK, NY 10001-7708			MAIL DATE	DELIVERY MODE
			03/17/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/521,779	<b>Applicant(s)</b> KOMIYA ET AL.
	<b>Examiner</b> Mia M. Thomas	<b>Art Unit</b> 2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 27 October 2008.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1 and 17-35 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1 and 17-35 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 27 October 2008 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/27/08

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_

5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

#### **DETAILED ACTION**

##### **Response to Notice of Non-Compliance**

During a telephone interview with the applicant on 9 February 2009, the applicant explained that a properly filed amendment to the specification was processed on 17 March 2008, however, was not entered by the USPTO thus prompting the Examiner to forward a Notice of Non-Compliance. After an additional telephone interview with the applicant on 17 February 2009, The Examiner was able to locate the paper filed on 17 March 2008 concerning applicant's amendment to the specification. As of the filing of this response, the Notice of Non-Complaint Amendment has been withdrawn and a complete response to applicant's request for continued Examination follows herewith.

##### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 27 October 2008 has been entered.

##### ***Response to Amendment***

2. This Office Action is responsive to applicant's remarks received on 27 October 2008. Reconsideration of this application, as amended, is respectfully requested. Claims 2-16 have been canceled. Claims 1, 17-35 are now pending in this instant application. A complete response to applicant's remarks follows herewith.

***Response to Arguments***

3. Applicant's arguments, see page 14, with respect to "The Title (Specification)" have been fully considered and are persuasive. The objection of "the title" has been withdrawn.
  
4. Applicant's arguments with respect to "The Specification" detailed at page 14 of applicant's remarks have been fully considered, accordingly the Examiner has found that there is written support in the original specification for the specification amendments.
  
5. Applicant's arguments with respect to "Prior Art Rejections" at pages 17-22 have been considered but are moot in view of the new ground(s) of rejection. See newly rejected claims below.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elbaum et al. (US 6,201,880 B1) in combination with Gofman et al (US 20040076921 A1), Cooper et al.(US 5051823 A) and Rawicz et al. (US 6111650 A).

**Regarding Claim 1:** (Currently Amended) Elbaum teaches an image processing system (Refer to Figure 1, numeral 10) comprising: an image capturing unit (Refer to Figure 1, numeral 24 "an electronic camera 24"); an image processing unit (Refer to Figure 1, numeral 26).

Elbaum also teaches an image pick-up device which picks up the subject image formed by the image pick-up optical system and obtains a subject signal from the subject; (Refer to Figure 1, numeral 20; "The image plane of an electronic camera 24 may be optically coupled to the image input portion 20 of the handpiece 12 through a separate optical fiber or fiber optic bundle 23. Preferably, the camera is a digital electronic camera having a charge-coupled-device (CCD) imaging array coupled to the optical fiber 23. The CCD may be located within the handpiece 12 as well, as discussed with respect to the embodiment of FIG. 2. A CCD is preferred because of its high signal-to-noise ratio and its direct generation of digital signals for immediate processing. An intra-oral camera could also be positioned in the mouth, adjacent the side of the tooth opposite the side being illuminated. Alternatively, a video camera may be used and the video images subsequently digitized." at column 6, line 1-14).

Gofman teaches an illuminating light source including a plurality of light-emitting devices which respectively emit illumination lights having a plurality of different characteristics of spectroscopic distributions (Refer to Figure 6a for example, "FIGS. 6a and 6b illustrate aspects of a carrier 57 for physically packaging the LEDs 22. By way of example, carrier 57 comprises four surface mount LEDs 22 (available, as described above, as LUMILED LEDs from Luxeon)... " at paragraph [0038]); an image pick-up optical system which picks up-forms an image of a subject illuminated by the illuminating light source (Refer to Figure 8a, paragraph [0037-0038,0043-0044])

Cooper teaches a control unit which controls light emission by the plurality of light-emitting devices and image pick-up by the image pick-up device and which switches the image capturing

unit between a spectroscopic image capturing mode in which it obtains a still image of a subject spectroscopic image and a moving image capturing mode in which it obtains a moving image thereof ("At the proximal end (not shown) of handle 101 is located one or more connectors for connection, via a cable assembly (not shown) to a video processor and control unit and a source of laser energy." at column 3, line 62)

wherein, in the spectroscopic image capturing mode, the control unit controls the plurality of light-emitting devices to sequentially emit light according to the characteristics of spectroscopic distributions by a plurality of times interlocking the light emission with an exposure timing of the image pick-up device thereby causing the image pick-up device to obtain a plurality of subject spectroscopic images; and wherein, in the moving image capturing mode, the control unit is arranged to (i) cause light emission of a light-emitting device for a single specific primary color or cause light emission of light-emitting devices for a plurality of specific primary colors selected from the plurality of light-emitting devices, (ii) cause simultaneous light emission of all of the plurality of light-emitting devices, or (iii) cause sequential light emission of a group of R devices, a group of G devices, and a group of B devices selected from the plurality of light-emitting devices, group by group, and to cause the image pick-up device to obtain a moving image; ("As a feature of one embodiment of this invention, the handle of the dental camera includes means for communicating all appropriate signals and fluids to and from the camera head and the laser light emission port, and, if desired, valves and switching means located on the handle for controlling such communication." at column 2, line 65) and a plurality of illuminating light sources with different characteristics of spectroscopic distributions; and a photographing operating unit which performs an image photographing operation, the image capturing unit interlocking the plurality of illuminating light sources with an exposure timing of the image pick

~~up device unit, selectively lighting on the plurality of illuminating light sources, and thus obtaining a plurality of subject spectroscopic images, and~~

Specifically, Cooper teaches a control unit that includes light sources (light emitting devices) to handle all means of communication of all of the appropriate signals for connecting the dental instrument with the laser device and image processing apparatuses.

Rawicz teaches the image processing unit comprising: ~~an image memory unit which stores the subject spectroscopic images photographed by the image pick up unit; wherein the image processing unit calculates a desired image based on the image signal stored in the image memory unit, and wherein the image processing unit further comprises an image identification calculating unit which calculates grade data to be used to determine a grade of a color of the subject based on one or more of the subject spectroscopic images stored in the image memory unit~~ captured by the image capturing unit when operating in the spectroscopic image capturing mode (Refer to Figure 5, numeral 46, further at column 6, lines 2-11).

Elbaum, Gofman, Cooper and Rawicz are combinable because they are in the same field of image processing including dental instruments and an apparatus for light emission elements.

All of the claimed elements were known in the prior art and one skilled in the art could have been combined the teachings of Elbaum in combination with Gofman, Cooper and Rawicz as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

The suggestion/motivation for doing so would have been to create " dental instrument including a laser device and an electronic video dental camera is provided having a single handle and a convenient shape, thereby being readily manipulated by dentists who are universally familiar with the manipulation of prior art dental tools. A dental instrument constructed in accordance with the teachings of this invention includes a handle to be held by the user, a distal portion which is to be placed inside the patient's mouth, a laser light emission port located at or near the distal end, means for transporting laser light from an external laser source to the laser light emission port, and a camera head located at or near the distal end of the device, with the camera head being formed at an angle to the handle in order to provide a field of view which includes the portion of the patient which is being treated by the laser light emanating from the laser light emission port." at column 2, line 32+, Cooper.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Elbaum, Gofman, Cooper and Rawicz to obtain the specified claimed elements of Claim 1.

**Regarding Claims 2-16 (Canceled).**

8. Claims 17-23, 25-28, 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elbaum et al. (US 6,201,880 B1) in combination with Gofman et al (US 20040076921 A1), Cooper et al.(US 5051823 A) and Rawicz et al. (US 6111650 A) and further in view of Gill et al. (WO 02/12847 A1).

**Regarding Claim 17: (Previously Presented) Elbaum, Gofman, Cooper and Rawicz in combination teach all the claimed elements as rejected above. Elbaum, Gofman, Cooper and**

Rawicz in combination does not specifically teach the grade data indicates a grade of a shading guide for comparing the color of a tooth as the subject.

However, Gill teaches the grade data indicates a grade of a shading guide for comparing the color of a tooth as the subject (For example, "An image (7) of the prosthesis/crown (6) is then subjected to quality control by comparing its color to that of the original natural tooth (8). In the instance that there is a discrepancy in the match of color between the new crown and the original tooth (9) the dental technician can amend the recipe (5) to compensate for the color difference or alternatively request a further original photograph to work from. In this way, the color of the crown can advantageously be checked before it is released to the dentist for fitting into a patient's mouth." at page 17, lines 10+. Another example is provided at page 17, lines 23+).

Elbaum, Gofman, Cooper, Rawicz and Gill are combinable because they are in the same field of image processing including dental instruments and an apparatus for light emission elements.

All of the claimed elements were known in the prior art and one skilled in the art could have combined the teachings of Elbaum in combination with Gofman, Cooper, Rawicz and further in view of Gill as claimed; by known methods, with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

At the time that the invention was made, it would have been obvious to utilize the grade data indicating a grade of a shading guide for comparing the color of a tooth as the subject.

The motivation/suggestion for doing so would have been "to provide a color matching a natural tooth or set of teeth with a dental prosthesis", for example, at page 11, lines 5-18. (Gill).

Additionally, it would have obvious to combine the teachings of Elbaum, Gofman, Cooper and Rawicz for "relaying the captured image to a dental laboratory where a computer program is initiated so as to analyze the color values of the image of the tooth and to generate a values of intensity of red, green, blue components of the image. (page 12, lines 10-23, Gill).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Elbaum, Gofman, Cooper, Rawicz and Gill to obtain the specified claimed elements of Claim 17.

**Regarding Claim 18:** (Previously Presented) Gill teaches the image processing unit calculates a ceramic compounding ratio of a false tooth based on the grade data to obtain false tooth ceramic compounding ratio data (Refer to page 14, lines 1-11; similarly, refer to page 17, line 23-page 18, line 1-9).

**Regarding Claim 19:** (Previously Presented) Gill teaches a computer connected to the image processing unit through a network, wherein the image processing unit transfers the grade data and the false tooth ceramic compounding ratio data to the computer (Refer to page 7, lines 10-13; Refer to page 8, line 6-7).

**Regarding Claim 20:** (Previously Presented) Gill teaches a ceramic compounding ratio

calculation database connected to the computer, wherein the computer searches for a ceramic compounding ratio from the ceramic compounding ratio calculation database based on the grade data and the false tooth ceramic compounding ratio data (Refer to page 8, line 19-page 9, line 5).

**Regarding Claim 21:** (Currently Amended) Rawicz teaches a ~~monitor~~-display unit connected to the image processing unit, wherein the image identification calculating unit calculates the grade data before and after treatment of the subject, and the display unit displays the grade data is ~~displayed on the monitor~~ calculated before and after the treatment of the subject (Refer to column 6, line 9-11)

**Regarding Claim 22:** (Previously Presented) Gill teaches an abutting portion formed in a cylindrical shape which abuts the subject (Refer to page 5, lines 17-29).

**Regarding Claim 23:** (Previously Presented) Gill teaches the abutting portion is configured to be detachably attached to the image capturing unit (Refer to page 5, line 21-29; specifically, "this arrangement is of particular advantage when taking images of a patient's teeth that are not in central position in the mouth. In use, the tube is extended prior to taking of the image and may be retracted when not in use."). For clarity, the Examiner is stating that Gill teaches that this tube can be retracted and manipulated so that it can be detached from the overall system to move and operate accordingly with the operand's directives.

**Regarding Claim 25:** (Previously Presented) Elbaum teaches the image capturing unit further comprises an optical member which reduces the illuminating unhomogeneity between the

illuminating light source and the subject(Refer to Figure 1, numeral 14; "The system 10 includes a source of illumination 11 which provides light to a handpiece 12 via an optical fiber or optical fiber bundle 14." at column 5, line 57).

**Regarding Claim 26:** (Previously Presented) Elbaum teaches the plurality of illuminating light sources include at least one of: (i) a light source with a center wavelength of 780 to 900 nm, and (ii) a light source with a center wavelength of 300 to 380 nm ("The filters may be provided on a filter wheel (not shown), for example. Four wavelength bands are preferred, centered at 500 nm, 600 nm, 700 nm and white light." at column 6, line 45).

**Regarding Claim 27:** (Previously Presented) Elbaum teaches the image capturing unit and the image processing unit are integrally formed (Refer to Figure 1, numerals 10).

**Regarding Claim 28:** (Previously Presented) Elbaum teaches the image capturing unit includes a color chip for calibration in the image processing unit ("The imaging camera 514 was a Toshiba 1/2"570x high-resolution CCD (720x570 pixels), equipped with a 23-mm Schneider function/1.4 Xenoplan lens and an extender for reducing the field-of-view (FOV). The aperture and focus were adjustable. The image calibration scale was 43 pixels/mm over a 11.5-mm FOV." at column 7, line 7).

**Regarding Claim 30:** (Previously Presented) Elbaum teaches the image processing unit comprises image filing software, and image data photographed upon operating the photographing operating unit is recorded in accordance with the image filing software (Refer to Figure 14; For example, "Overall image brightness may also be adjusted by the operator based

on his observation of the image on the monitor. The operator can override the intensity set by the software, if desired." at column 12, line 5. Another example, "The image is analyzed by the computer software at step 102 to determine whether the maximum image intensity is within a predetermined range." at column 11, line 49).

**Regarding Claim 31:** (Previously Presented) Elbaum teaches the image capturing unit further comprises subject portion sensing means for obtaining positional information of the subject ("...the preferred embodiment of the present invention permits the operator to display on the monitor 28 one or more computer-calculated numerical measures of selected properties of the image which can assist the dentist in interpretation." at column 13, line 39).

**Regarding Claim 32:** (Previously Presented) Elbaum teaches image capturing unit further comprises distance measuring means for managing a size of the subject in the photographed image ("...the preferred embodiment of the present invention permits the operator to display on the monitor 28 one or more computer-calculated numerical measures of selected properties of the image which can assist the dentist in interpretation." at column 13, line 39).

**Regarding Claim 33:** (Previously Presented) Rawicz teaches the image capturing unit further comprises a monitor which displays the image of the subject (Refer to Figure 5, numeral 52),

Gill teaches the image capturing unit controls the monitor to display a difference between a photographing distance measured by the distance measuring means and a target photographing distance (Refer to page 16, lines 16-page 17, line 8).

Rawicz and Gill are combinable because they are in the same field of image processing of dental instruments.

It would have obvious to combine the teachings of Gill and Rawicz for "relaying the captured image to a dental laboratory where a computer program is initiated so as to analyze the color values of the image of the tooth and to generate a values of intensity of red, green, blue components of the image. (page 12, lines 10-23, Gill).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Gill and Rawicz to obtain the specified claimed elements of Claim 33.

**Regarding Claim 34:** (Previously Presented) Rawicz teaches the image capturing unit further comprises a monitor which displays the image of the subject (Refer to Figure 5, numeral 52),

Gill teaches the image capturing unit controls the monitor to display an indication that the photographing distance measured by the distance measuring means matches a target photographing distance (Refer to page 17, lines 5-16).

Rawicz and Gill are combinable because they are in the same field of image processing of dental instruments.

It would have obvious to combine the teachings of Gill and Rawicz for "relaying the captured image to a dental laboratory where a computer program is initiated so as to analyze the color

values of the image of the tooth and to generate a values of intensity of red, green, blue components of the image. (page 12, lines 10-23, Gill).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Gill and Rawicz to obtain the specified claimed elements of Claim 34.

**Regarding Claim 35: (Previously Presented)** Rawicz teaches the image capturing unit further comprises a monitor which displays the image of the subject(Refer to Figure 5, numeral 52),

Elbaum teaches the image capturing unit obtains information of a desired photographing distance from images previously picked up, calculates a magnification correcting coefficient based on information of an actual photographing distance measured by the distance measuring means and the desired photographing distance information, and controls the monitor to display the image of the i0 subject with a magnification corrected based on the magnification correcting coefficient ("The digital image processing conducted at step 120 provides visually enhanced representations of variations in the image that help the dentist diagnose the condition of the tooth. Preferably, several options are available. For example, digital zooms into and out of the ROI, wavelet amplitude and phase-representations, iso-intensity contours and line scan profiles, may be provided and selected. Digital zooms into the ROI magnify the image. Digital zooms out of the ROI enable the operator to view the area surrounding the ROI, as well as enabling selection of a different ROI. Iso-intensity contours may assist in identifying local gradients which are characteristic of caries." at column 13, line 8).

Rawicz and Elbaum are combinable because they are in the same field of image processing specifically with regards to dental instruments.

It would have obvious to combine the teachings of Rawicz and Elbaum. The motivation/suggestion for doing so would have been "The quality of the displayed image may be judged subjectively by the operator for its perceived utility for diagnosis and the image can be adjusted, if necessary. The operator can adjust the intensity and wavelength of the illumination, and other imaging parameters such as exposure time, through the keyboard 30, the mouse 32 or the hand control 36, until the image quality is satisfactory. The computer 26 can also automatically control certain imaging parameters, such as the intensity of the light, as discussed further, below." at column 11, line 16-25, Elbaum.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Rawicz and Elbaum to obtain the specified claimed elements of Claim 35.

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elbaum et al. (US 6,201,880 B1) in combination with Gofman et al (US 20040076921 A1), Cooper et al.(US 5051823 A) and Rawicz et al. (US 6111650 A) and further in view of Vari (US 5,503,559).

**Regarding Claim 24: (Previously Presented)** Elbaum, Gofman, Cooper and Rawicz in combination teach all the claimed elements as rejected above. Elbaum, Gofman, Cooper and Rawicz in combination does not specifically teach reflected light rejecting means, which prevents the illuminating light source from being photographed to the subject.

However, Vari teaches reflected light rejecting means, which prevents the illuminating light source from being photographed to the subject (Refer to Figure 14, numeral 66. "The dichroic filter rejects any excitation that may be included in the return light. The stop has a slit for allowing only a narrow ribbon of light to reach the grating. The grating separates the return light along an axis at a distance proportional to the wavelength of the return light." at column 3, line 20).

Elbaum, Gofman, Cooper, Rawicz and Vari are combinable because they are in the same field of image processing, specifically with respect to dental instruments.

All of the claimed elements were known in the prior art and one skilled in the art could have combined the teachings of Elbaum in combination with Gofman, Cooper, Rawicz and further in view of Vari as claimed; by known methods, with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a reflected light rejecting means as taught by Vari because "the excitation light induces the tissue within the root canal to fluoresce. The fluorescent light is collected by the optical fiber and transmitted back to a sensor that generates electrical signals indicative of the intensity of light within a predetermined wavelength band." (Vari, abstract).

The motivation/suggestion of the combination of these elements can provide an instant detection of a tooth with the absence of light for stronger detection purposes.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Elbaum, Gofman, Cooper, Rawicz and Vari to obtain the specified claimed elements of Claim 24.

10. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Elbaum et al. (US 6,201,880 B1), Gofman et al (US 20040076921 A1), Cooper et al.(US 5051823 A) and Rawicz et al. (US 6111650 A) and further in view of Melnyk et al (US 6276933 B1).

**Regarding Claim 29:** (Previously Presented) Elbaum, Gofman, Cooper and Rawicz in combination teach all the claimed elements as rejected above. Elbaum, Gofman, Cooper and Rawicz in combination does not specifically teach a portable terminal device having a photographing function and wherein an illuminating light source unit having the plurality of illuminating light sources as one unit is attachable to the portable terminal device.

Melnyk teaches a portable terminal device having a photographing function (Refer to Figure 1; "The device illuminates the incisal part of the tooth with white light and detects the light from the opposite side of the tooth. Signals indicating the values of transmitted light, the calibrated light, and the ambient light are processed and displayed on the LCD as a translucency factor. The device comprises a handpiece with a U-shape distal holder." at abstract) and wherein an illuminating light source unit having the plurality of illuminating light sources as one unit is attachable to the portable terminal device (Refer to Figure 2a and 2b; "The proximal ends of the

illuminating fiber optic are coupled to white light emitting diodes (LED), while distal ends of the receiving fiber optic are coupled to photodetectors." at column 2, line 66+).

Elbaum, Gofman, Cooper, Rawicz and Melnyk are combinable because they are in the same field of image processing including dental instruments and an apparatus for light emission elements.

All of the claimed elements were known in the prior art and one skilled in the art could have combined the teachings of Elbaum in combination with Gofman, Cooper, Rawicz and further in view of Melnyk as claimed; by known methods, with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

The motivation/suggestion for combining the teachings of Elbaum, Gofman, Cooper, Rawicz and Melnyk would have been "An advantage of the present invention is that the dental translucency analyzer is small and portable and can be easily operated by one hand. Another advantage of the present invention is that translucency of the tooth is measured in a direct mode without affecting the results by uncertain absorption and scattering parameters of the tooth." at column 3, line 27, Melnyk.

Therefore, it would have been obvious to the skilled artisan to combine the teachings of Elbaum, Gofman, Cooper, Rawicz and Melnyk to obtain the specified claimed elements of Claim 29.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2006/0251408 A1

US 2002/0191102 A1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is (571)270-1583. The examiner can normally be reached on Monday-Thursday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*/Mia M Thomas/*

Examiner, Art Unit 2624

*/Vikkram Bali/*

Supervisory Patent Examiner, Art Unit 2624